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ABSTRACT

The interaction of emotion and cognition has received experimental attention, but the results have generally been weak and sometimes contradictory. Why this work on mood and memory has faltered is discussed, and a more holistic approach to the study of emotion and cognition is proposed. It is argued that a constructivist approach to memory may be more appropriate than currently used associational theories for exploring the interaction between cognition and emotion. The experimental approach is critiqued as incompatible for the study of emotion, and a constructive and holistic approach is advocated for research in this area. A conceptual framework based on current findings is used to suggest some potential directions for research. The three consistent themes that have emerged from work on mood congruent memory that can provide a starting point for investigation are: (1) the idea that emotion in any form represents a source of information or meaning for the individual; (2) that this meaning may be particularly salient under conditions of uncertainty; and (3) that emotional meaning will also be salient when the self is involved to some degree. (Contains 69 references.) (SLD)

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**Mood and Memory Research:
The Need for a More Wholistic Approach**

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Introduction

The interaction of emotion and cognition has received tremendous experimental attention, particularly in the area of mood congruent memory. Important as this work is, the results are, with few exceptions, generally weak and sometimes contradictory. I briefly consider some methodological and theoretical reasons for why the work on mood and memory has faltered and then discuss a more wholistic approach to the study of emotion and cognition. I argue that a constructivist approach to memory may be more appropriate than currently used associational theories for exploring the interaction between cognition and emotion. I also critique the experimental approach as incompatible for the study of emotion and argue for a constructive and wholistic approach to research in this area. A conceptual framework based on current findings is used to suggest some potential directions for research.

Background

The history of the psychological study of emotion and cognition can be traced along a continuous path which began in the late 1800's and temporarily ended during the decade of the 1950's. At that time, a period which is often marked as the beginning of cognitive science, questions concerning emotion and cognition abruptly disappeared from the mainstream of psychology and were not asked again until the

late 1970's. This span of over twenty years is an important one in cognitive psychology; work in such areas as memory, perception, imagery, language and problem solving had progressed at an enormous rate, but the neglect of emotional variables and their impact on these various processes had compromised this progress.

There are a host of reasons for the neglect of emotions by early cognitive researchers. They include the dominance of behaviorism just prior to the growth of cognitive science, the rejection of Freudian theory by mainstream psychology, the computer revolution which prompted machine metaphors of mind, and Piaget's emphasis on the development of logical thinking. However, it is likely that one of the more prominent reasons is that emotion tests the limits of the experimental approach which has dominated most of the research in cognitive psychology. Emotional experience is personal and subjective and therefore difficult, if not impossible to define in operational terms. Emotion can be defined through the stimulus that brings about an emotional reaction, but this definition is problematic since what is emotion-inducing for one person may not be for another. Also, context makes a difference; an individual may react emotionally in one context, but not in another (Branscombe, 1988).

Despite the difficulties of studying emotion from an experimental approach, cognitive researchers and theorists recognized, in the late 1970's, that emotion could no longer be ignored. Since that time the interaction of emotion and cognition has received tremendous experimental attention, particularly in the area of mood congruent memory. A number of findings have emerged from this work, including mood-state-dependent retrieval (MDR), mood congruent learning and mood congruent recall. MDR involves the idea that material learned or encoded in a specific mood will be more easily retrieved from memory if the same mood is experienced during recall. Mood congruent learning suggests that individuals selectively attend to and subsequently learn material that is affectively congruent with their current mood. Mood congruent recall refers to the idea that mood at time of recall will bias an individual to retrieve memories which are affectively congruent with his or her current mood. Ground breaking and important as this work has been, the results of the numerous studies conducted thus far are, with few exceptions, generally weak and sometimes contradictory.

Critical Perspective

I briefly consider two critical perspectives on why the work on mood congruent memory has faltered.¹ They are

¹The following is not intended as a thorough review of work in this area, but meant to highlight some of the more prominent controversies and issues. For more detailed

methodological and theoretical. Methodologically, some of the inconsistencies in the work on mood congruent memory stem from the fact that mood is variously defined, manipulated and measured from study to study, and it has not been shown that these differences in conceptualization, measurement, and manipulation all converge on the construct of mood. Other methodological problems stem from the laboratory manipulation of mood state and concerns regarding the ecological validity of the memory tasks used in most of the work on mood congruent memory.

In a broader vein, the inconsistencies in the work on mood congruent memory may stem from a methodological approach which is quantitative and experimental. Although, the approach has yielded some interesting findings, it may be ill-suited for understanding the ways in which cognition and emotion interact. The use of the scientific method is based on the presumption that the world can be described according to a discourse which is logical, rational, and objective. Emotion tests the limits of this discourse precisely because it is culturally perceived as illogical, irrational, and subjective. How then can a discourse, "initially undertaken precisely to purify problems solving of all taint of passion" be used to study an aspect of human experience from which it has systematically been divorced?

reviews, the reader is directed to Blaney (1986), Kaufman (1989), and Ellis and Ashbrook (1989).

(Bruner, 1986) The contradiction is a compelling one. Nevertheless, the study of mood congruent memory has proceeded in experimental fashion and it has done so by attempting to objectify a subjective experience. One consequence of this approach is a collection of findings which may be artifacts of the laboratory rather than ecologically valid insights.

The second critical perspective for understanding the weaknesses in the work on mood congruent memory is theoretical and concerns the spreading activation and semantic network model of memory (Anderson & Bower, 1973; Collins & Loftus, 1975) that has informed the majority of research in this area. The model, adapted by Bower (1981) and Bower and Cohen (1982) has come to be known as the network theory of affect.

I argue that there is a basic incompatibility between emotion and network theories of memory. These theories rest on a computer metaphor of mind which is a powerfully predictive heuristic for "cold" cognitive activity, but loses it's predictive value when affect is added to the metaphor. For example, mood is conceived as a node or atomistic unit which is embedded in a structure or assemblage of associations. When mood is felt or activated some or all of its associative links are activated as well. In reference to mood-state-dependent retrieval, this

suggests that if mood at recall matches a mood that was experienced during learning, then the nodes and associative links to that mood that were established during learning will be activated by the recall mood. With regard to mood congruent recall, the theory suggests that certain memories, particularly those related to the self, carry some degree of affective valence. Therefore, regardless of how those memories were originally placed in the network of associative structures, they will be activated and hence retrieval will be enhanced when a mood is experienced that matches the affective valence of those memories. Mood congruent learning in this theory is a bit harder to explain, but network assumptions suggest that mood while learning serves to activate mood congruent associations. The amount or spread of activation may depend on mood intensity, but regardless, the activated associations function to facilitate an elaboration on mood congruent stimuli. This elaboration accounts for enhanced learning of these stimuli.

The predictions outlined above have received only inconsistent support in the literature. Researchers have failed to consistently replicate mood-state-dependent retrieval. This suggests either that a mood node during learning is not reaching a necessary threshold of activation or that a network conception may not be an appropriate

metaphor². Bower and Mayer (1989) explored the former possibility in a series of six experiments using Thorndike's (1932) notion of "causal belongingness;" subjects seeing a causal connection between their moods and to-be-learned material. The MDR effect was obtained in only one of the six experiments. The only consistent demonstrations of MDR have occurred with autobiographical material (Bower, 1981), but these findings can also be interpreted as instances of mood congruent recall.³

Mood congruent learning is perhaps the most robust finding in this literature. There are fairly consistent findings from studies of mood congruent learning for self-relevant stimuli (Alexander & Geunther, 1986; Brown & Taylor, 1986; Ingram, 1984). Though it has not been established that self-relevance is necessary and/or

²Representative studies of MDR include Bartlett & Santrock (1979); Bartlett, Burleson & Santrock (1982); Bower (1981); Bower & Mayer (1985); Bower, Gilligan & Monteiro (1981); Bower, Monteiro, & Gilligan (1978); Duncan, Todd, Perlmutter, & Masters (1985); Garcia & Beck (1985); Isen, Shalker, Clark, & Karp (1978); Laird, Wagener, Halal, & Szegda (1982); Leight & Ellis (1981); Macht, Spear, & Levis (1977); Mecklenbrauker & Hager (1984); Nasby & Yando (1982); Schare, Lisman, & Spear (1984); Wetzler (1985).

³In an interesting pair of experiments, Wenzlaffe, Wegner, & Klein (1991) found a mood-dependent effect for suppressed thoughts. Subjects, suppressing a thought in a particular mood state, experienced a rebound of related thoughts when the mood state was re-experienced. The reverse finding was also obtained. Subjects suppressing a thought while in a particular mood state, later experienced a recurrence of that mood state when asked to express the suppressed thought. Further investigation will be needed to adequately assess the implications of this work for network theory.

sufficient to demonstrate mood congruent learning, it is plausible that this variable functions to make mood more salient and thus more effective as a contextual cue (see Blaney, 1986; Forgas, Bower, & Moylan, 1990, Kaufman, 1989; Morris, 1989). In regard to network theory, if propositions related to the self (Bower & Gilligan, 1979) or schema representations of self (Markus, 1977) are activated along with nodes relevant to mood state, then the sum of activation emanating from both of these sources would account for enhanced recall for mood congruent and self-relevant stimuli.

The research on mood congruent learning for narrative material also provides fairly strong support for network assumptions, but this support is constrained by at least two limitations. First, if a narrative is evenly structured such that positive and negative events appear with equal frequency, mood congruent learning can be demonstrated. However, if a narrative is skewed toward one or another of these valences then the emphasis in the narrative predicts recall. Additionally, if subjects are explicitly told that they will be tested for recall, they appear to rely on both their moods and mood-irrelevant cues embedded in the narrative to facilitate recall (Bower, Gilligan, & Monteiro, 1981).

Secondly, it appears that this finding may be limited to induced mood states. In a series of three experiments conducted with subjects in naturally occurring moods, no significant findings of mood congruent learning were obtained (Hasher, Rose, Zacks, Sanft, & Doren, 1985). Ellis (1985) and Mayer and Bower (1985) argue, in response to these findings, that normative naturally occurring moods are not salient enough, and thus activation of emotion nodes in a network would not be expected. On this basis, though, a network theory of affect is impossible to falsify because it can always be maintained that a lack of mood effects on memory is a result of little or no activation of relevant nodes. Additionally, if this is the case, why would we ever expect mood congruent effects with low level naturally occurring mood states?

Mood congruent recall has received the greatest amount of experimental attention, and while a number of significant findings have been obtained, conflicting results, methodological flaws and the potential influence of cognitive priming and self-concept leave open the question of how best to interpret these findings.⁴

The generally weak findings for mood congruent recall could be strengthened through improved designs, but if more consistent data are obtained, this could pose problems for a

⁴See Blaney (1986) and Kaufman (1989) for a thorough review of studies of mood congruent recall.

network theory of affect. For example, if a subject in a neutral mood state learns a mixed list of affectively valent and neutral stimuli, it would not be expected that the stimuli would be encoded in a mood congruent fashion. Yet, on the basis of the theory, it is predicted that an induced mood state at recall will enhance retrieval for the previously learned mood congruent stimuli. How could this occur if the stimuli were not originally encoded according to the mood state induced at recall? Teasdale (1986) suggests that effects such as these be broadly viewed as instances of mood-state-dependent retrieval. That even though the stimuli were encoded in a neutral mood in the laboratory, it is likely that in the life history of the subject the stimuli were originally associated with salient mood states. The failure to obtain reliable findings of MDR weakens this explanation, and further we are again confronted with an assumption that is not falsifiable.

The last point of departure for evaluating the efficacy of a network theory of affect stems from the literature on naturally occurring moods⁵. Although the research, currently, does not provide a strong enough foundation to adequately assess network assumptions, it does suggest in a preliminary sense that network theory may not be adequate to explain the findings. Presently, the tentative conclusions

⁵See Blaney (1986) for a detailed review of this work.

that can be drawn from this literature are; groups evaluated as nondepressed tend to recall positive material more so than negative material, and groups labeled as depressed tend to recall both types of material with just about equivalent frequencies (Buchwald, 1977; Dobson & Shaw, 1981; Finkel, Glass & Merluzzi, 1982; Hamman & Zuppan, 1984; Kuiper & Derry, 1982; Mathews & Bradley, 1983). These results are based on within group summaries of data, and when comparisons are drawn between these groups, the positive recall bias of nondepressed groups tends to be equivalent with that of depressed groups. This tentatively suggests that conclusions based on manipulated mood states cannot be generalized to naturally occurring mood states. However, the preliminary nature of this work suggests that there may be experimental conditions which will replicate the effects found for the mood manipulation approach.⁶

A Constructivist Approach

On the basis of the critique offered here, I suggest that a constructivist approach to memory (Bartlett, 1932; Bransford, 1979; Jenkins, 1974; Spiro, 1977; Tulving, 1983) (as opposed to the currently used network theory of affect) may be more appropriate for exploring the

⁶Most of the work in this area is conducted by researchers primarily interested in clinical depression and potential therapeutic techniques. Positive mood states have not been extensively studied.

interactions between cognition and emotion. One of the basic reasons for considering this approach is, in contrast to associational theories, recall is not considered to be an activation and consequent reproduction of static associational structures. Rather, it is viewed as a constructive process, such that mental structures (if they exist) are transformed as a function of recall.

Bartlett (1932) argued that "remembering is not the re-excitation of innumerable fixed, lifeless, and fragmentary traces. It is an imaginative reconstruction, or construction, built out of the relation of our attitude towards a whole active mass of past experience" (p. 213). More recently, Tulving (1983) states that "remembering is not an activation of something that exists in the form of a latent disposition,...rather it is a constructive activity that uses components from episodic memory (the engram) as well as semantic memory (the cue) and that results in a mental experience that the rememberer subjectively identifies as remembering an event" (p. 180). Justifying this view, Tulving declares that "we can assume that in many cases the attempt to understand recollection in terms of encoding processes and the stored episodic information alone is analogous to trying to understand the development of organisms in terms of hereditary factors alone" (p. 181).

Tulving proposes the unifying idea of ecphoric memory which is not isomorphic to the contents of memory, but is a product of retrieval information. He states that "what a person recollects about an experience is not determined by the memory trace of that experience. The memory trace is only one important co-determinant of recollection; the other equally important one is the retrieval information that is used in the process of actualizing the trace" (p. 5).

Evidence in support of the idea that memories are transformed as a function of recall comes from studies such as those conducted by Loftus and Palmer (1974). Subjects were shown a film of an auto accident and then asked one of three leading questions concerning the film ("About how fast were the cars going when they bumped?" "collided?" or "smashed?"). A week later, all the subjects were asked if they had seen broken glass, something which had not been shown in the film. Subjects were more likely to answer yes if they had been originally asked the third question above (i.e. "smashed"). Studies such as these (see Bransford, 1979; Jenkins, 1974; Spiro, 1977) suggest that recall is much more complex than the activation of stored memories; it can, at times, involve a constructive or reconstructive process such that what is remembered is informed and transformed by the contextual information available at the time of retrieval.

What are the advantages of utilizing a constructivist approach? On a very general level, network models of the mind do not seem capable of capturing the complexity of feeling and thinking. In particular, they omit the individual actor in attempting to understand the interrelationship of thinking and feeling. Theories of information processing are theories about the performance and capacity of the cognitive system. They are not however, about the performer, without which the system could not exist (Markova, 1982).

In the literature on mood and memory, mood is not only isolated from the individual; it is also isolated from all other potential factors which may influence encoding and retrieval. From an associational perspective this is a legitimate practice because it is assumed that variables, once studied on a molecular level, can be pieced together to form a molar description. However, from a constructivist perspective, a molecular view can never reveal the larger molar picture, because simply "the whole is much larger than the sum of its individual parts." More wholistic studies are necessitated by this perspective and although they will add a tremendous degree of complexity, this is preferable to the current molecular research endeavors. The call for a top-down approach is not new but it bears repeating. As Zimiles (1986) states:

Psychologists and educators have become so steeped in microscopic dimensions and quantitative measures that they have come to believe that the main reality of cognitive functioning is revealed by their assessment procedures. There is a tendency to forget that these procedures were devised to provide crude (and efficient) indices of levels of functioning whose actual character is more complex. (p. 81)

The abandonment of spatial conceptions of mind represents another advantage of adopting a constructivist approach. If memory is more than reproduction or activation of stored networks; if memory is dependent on context and contexts change with each act of remembering, then it makes no sense to speak of structures existing in space. It is certainly true that we know things in a semantic sense and that we remember events in an episodic sense, but this need not imply that these things and events continue to exist when we are not attending to them.

An alternative to seeing mind as organized in space is to view it as organized in time and this temporal view dispenses with many of the problems associated with the spatial view. In relation to the network theory of affect, the inconsistent support for the predictions it has generated is readily explicable. In the case of mood-state-dependent retrieval, a constructivist would not expect congruent recall. The idea that a cue experienced during recall matches a cue experienced while learning is irrelevant because what was learned is temporal and subject to change and will be further transformed by the act of

remembering. Additionally, it would not be expected that the mood or emotion associated with the original event would be the same; it too is temporal and subject to change. With regard to mood congruent recall, the same reasoning would apply, particularly when it is "broadly" viewed as an instance of mood-state-dependent retrieval. A case study of autobiographical memory serves to illustrate the point. Linton (1982) briefly recorded and rated, on a number of dimensions, two salient experiences a day for six years. On a monthly basis she drew items from a rapidly accumulating pool of events and attempted to reconstruct the events in a number of ways. Of particular interest here are her emotionality ratings of the events when they occurred as compared to her reconstruction of them.

Under some circumstances, the emotions currently associated with past events may be at variance with our memories of the emotions associated with the events at the time. It is often difficult to recall the intensity of past emotion... Sometimes the memory of the emotion is only remotely present (I may wonder *why* I experienced a strong emotion if it is obvious that I did or I may *remember* having had the emotion but be completely removed from it in the present). This discrepancy between memory of the emotion and the presently experienced emotion creates considerable problems when I attempted to rate items years later. The emotion I remember having felt when the event occurred, the emotion that is aroused now, and how do I discern the difference? (Linton, 1982, p. 88)

Certainly it is possible that a salient mood experienced in the laboratory will function to remind a subject of something. However, to suggest that the cause of

that reminding is the match between a past and present mood state is, I believe, reading too much into the evidence. Additionally, a network interpretation suggests that mood congruent memories were originally encoded according to mood state. As Isen (1984) states;

it is very unlikely that material would be learned in so limited and inflexible a way. Rather, at least in the case of positive affect, it is likely that both usual and unusual ways of encoding, usual and unusual senses of meaning and of stimuli, might be available for use. (p. 225)

The strong findings for studies of mood congruent learning for self-relevant stimuli are explicable within both a constructivist and a network theoretic approach. While underlying explanations will differ, this finding is a predictable one. Considering that a subject has just experienced a mood induction which focuses attention on the self, it should not be surprising that such a subject would attend more to stimuli in a mixed presentation that is both affectively congruent and self-relevant. Work on mood altered processes and structure suggests that the basis for this increased attention is not merely due to associational elaboration as would be indicated by a network approach. Rather, when subjects are faced with more complex tasks and materials, the meaning of these materials and the ways in which they are processed and/or structured may be temporarily altered as a function of mood (Isen, 1988; Isen & Daubman, 1984; Isen, Daubman, & Gorgoglione, 1987; Murray,

Sujan, Hirt, & Sujan, 1990). This is preliminary work, and Isen et al. (1987) caution that at the present time their results are compatible with network assumptions. At the very least, though, this work suggests that a constructivist approach may be worth pursuing.

Admittedly, the preceding arguments for a constructive approach are rational ones, and not based on empirical evidence. Additionally, there is some evidence, inconsistent as it is, which supports the various predictions of a network theory of affect. However, Tulving (1983) poses a relevant question: Is a strategy of retrieval the same as a theory of retrieval? It is abundantly clear, as is evident from the literature on mood congruent memory, that experiments can be designed which support network metaphors of memory, but they do not necessarily demonstrate that this is how memory functions.

Critique of the Experimental Approach

I argue here for a more wholistic approach to the study of mood congruent memory because there is an essential contradiction in using an objective experimental approach to study a subjective phenomenon. Objectivity does not entirely differentiate experimental study from more wholistic study, because in the latter case we still pursue objectivity. However it is objectivity of a different sort.

Keller (1985) distinguishes between static objectivity and dynamic objectivity. In the former the pursuit of knowledge "begins with the severance of subject from object," in the latter the subject is intimately intertwined with the object and the pursuit of knowledge proceeds by the "disentanglement of one from the other." She illustrates the difference with a distinction that Piaget (1972) makes between realism and objectivity.

Objectivity consists in so fully realizing the countless intrusions of the self in everyday thought and the countless illusions which result--illusions of sense, language, point of view, value, etc.--that the preliminary step to every judgment is the effort to exclude the intrusive self. Realism, on the contrary, consists in ignoring the existence of self and hence regarding one's own perspective as immediately objective and absolute. Realism is thus anthropocentric illusion, finality--in short, all those illusions which teem in the history of science. So long as thought has not become conscious of self, it is a prey to perceptual confusions between objective and subjective, between the real and the ostensible. (Piaget, 1972, p. 34)

The experimentalist who begins with the assumption that the subject of study can be severed from the object and additionally seeks to sever the subject from all but a well-controlled environment can be compared to Piaget's realist child. S/he is "a prey to perceptual confusions...between the real and the ostensible." With a wholistic approach these confusions are, at the very least, acknowledged to a much greater degree.

There are other underlying assumptions of an experimental approach which are not compatible with the study of affect. One is concerned with the domain of behaviors that can be reasonably studied within the confines of an experiment. Because of the demands of nomothetic assessment, only those behaviors which are amenable to reliable quantification and comparison are included in an investigation. This has the result of tremendously narrowing the domain of study at a time when our knowledge of the relation between affect and cognition can, at best, be considered only rudimentary. Related to this is the valuing of central tendencies over individual differences. Again, at this stage of our knowledge, differences may be much more revealing than similarities. This is particularly the case with the study of affect, since it can be expected that the experience of such, and its effect on thinking, will differ greatly from individual to individual. A wholistic approach with an emphasis on qualitative assessment can encompass a much more complex array of behaviors, and each of these behaviors can be studied with reference to the individual context in which they occur.

A more general assumption entailed by an experimental approach concerns the issue of prediction. In the domain of mood and memory, or more generally cognition and emotion, it is not at all clear that there is anything to predict. If

it is accepted that affective experience is multifaceted and interacts with cognitive functioning in complex and contextually dependent ways that may vary from individual to individual, then the task of prediction is daunting if not impossible. Also, our knowledge in this area is not well-developed, and the overarching theory from which current predictions stem is only inconsistently supported. Therefore, predictive research at this point in time may be unduly limiting and perhaps leading us in frustrating and unproductive directions.

Constructive/Wholistic Research

Given the limitations of the experimental approach, I suggest that we adopt a constructivist and wholistic approach to the study of emotion and cognition. My use of constructivist here is in the sense of constructing knowledge and I use wholistic in the sense of understanding how emotion impacts on cognition in natural (as opposed to laboratory) settings. To take a constructivist approach to the study of emotion and cognition means to learn about it in the same way that constructivists suggest that we engage students in the learning process. We need to study many different kinds of events in a variety of contexts so that we can construct our understanding and knowledge of cognition and emotion with both breadth and depth.

If we adopt a constructivist view of the relation between cognition and emotion, then theoretical prediction becomes secondary. If, as implied by a constructivist approach, cognitive structure and process are more appropriately viewed as temporal and fluid then there is no contextually-free theoretical analysis on which to base predictions. While it is true that we do engage in habitual ways of structuring the world around us, these habits of mind may be transformed at any time; they arise through contextual influences and may as quickly be transformed because of contextual influences. According to Tulving, such habits of mind may be more appropriately viewed as temporary strategies relevant to a particular context rather than revealing of a unifying theoretical analysis. As Jenkins (1974) states:

For the contextualist, no analysis is "the complete analysis." All analyses eventually "sheer away" from the event into more extensive contexts. This argues that there is no one analysis, no final set of units, no one set of relations, no claim to reducibility, in short, no single and unified account of anything. What makes an analysis good or bad for us is its appropriateness for our research and science and its utility in our pursuit of understanding and application. (p. 787)

Thus, from a contextualist and a constructivist view, it is the quality of an event rather than supposed mechanisms underlying an event which represents the central unit of analysis. And depending on our purpose, we want to

interpret and describe that event in wholistic relation to the context in which it occurs.

Conceptual Framework

There are three consistent themes that have emerged from the work on mood congruent memory which can provide a starting point for investigation. They include 1) the general idea that emotion in any form represents a source of information or meaning for an individual and 2) that this meaning may be particularly salient under conditions of uncertainty (Fiedler, 1988; Fiedler and Stroehm, 1986; Fiedler, Pampe, Scherf, 1986) and 3) that emotional meaning will also be salient when the self is involved to some degree.

Considering the first theme, emotion as a source meaning, we need to ask where does the emotion reside? The emotion is both in the individual and in the thing or object the individual seeks to understand or know more about. Our psychological concepts are inadequate to actually describe the emotional/cognitive connections to the world, but the emotion that resides in the thing and in the individual provides the opportunity for a connection between the thing and the individual. It is a part of what links the individual to the object or in one sense it is what makes the object interesting. As Egan (1979) notes, emotion is

the point of entry to the external world. In work on mood and memory, this emotional link is portrayed in very literal terms. It is caused by a congruence between an individual's mood state and the affective valence of the thing the individual is trying to understand or know. While congruity of mood state may be one way of describing this link, there are very likely many other ways that this link can be established. It is also likely that the link is established in a phenomenal way, or in a way that is particular to the individual and only understood in retrospect.

The second theme concerns the salience of emotional meaning under conditions of uncertainty. When we are in a situation where we are unsure of the outcome, emotional meaning residing in ourselves and in the external world will be particularly salient. Oatley (1992) suggests that when puzzles occur, our emotions point to cues that guide us in working our way through a problem or formulating a plan, or telling us something is amiss. The idea here is that when reason fails us, emotion can kick in. Along these lines, Suzanne Langer (1957) tells us "intelligence is a slippery customer; if one door is closed to it, it finds, or even breaks, another entrance to the world. If one symbolism is inadequate, it seizes another; there is no external decree over its means and methods" (p. 86).

Finally, the theme of the self is integral. If the object of knowing holds no relevance or potential to reflect the self then there will little opportunity for a link to be established that bridges the individual to the object. In the context of intuitive modes of knowing, Noddings and Shore (1984) discuss a unit on the civil war where in lieu of a chronological listing of events and actors, students are presented with films, photographs and paintings which portray the emotions of those who were there. The students are asked how they would feel?

What does the straight back and raised fist of the orator convey to you? What do you see in the heavy-lidded glance of Abraham Lincoln? Why does an army need drummer boys and flag bearers? Why would a man seize a falling flag and carry it forward to his own almost certain death? What does the man beneath the bayonet feel? What does the man holding it feel (p. 127)?

In thinking about these questions students are invited/engaged to see themselves in an uncertain object. They can imagine what individuals may have felt by projecting themselves into the frame of the civil war. What is uncertain begins to take on a sense of familiarity through an affective link that begins with the engagement of self. The student's construction of knowledge about the civil war begins to fill in the frame made possible by an affective link to the object of study.

Research Directions

Kieran Egan (1979) provides a framework for researching some specific ideas in relation to emotion and cognition in the classroom. He posits a theory of educational development which includes four stages. His first stage, the mythic stage spanning the age of four or five through nine or ten, is of particular interest. He states that learning at this stage

...involves making sense of the unknown world without in terms of the known world within. The things children have available to learn with are those things they know best, love, hate, joy, fear, good, bad. These are the intellectual tools and conceptual categories that children can employ in making sense of the outside world. The process of learning at the mythic stage involves projecting these known things onto the outside world and, as it were, absorbing the world to them." (p .14)

Egan's ideas echo what we have been discussing, but he adds another dimension for consideration. The idea that emotions are intellectual tools which provide access to the world suggests the constructivist or Piagetian idea of structure. It may be useful to consider the idea of emotional structures in the same sense as Piaget's physical structures and logical structures. Emotional structures may provide more than links to the external world, they may organize that world as well. To study children's learning from the perspective of emotional structures would add an entirely different perspective to the concept of intellectual development. If emotional organization of the

world is tied to and is as important as logical or physical organization, then in order to study development we must provide opportunities for children to emotionally operate on the world.

Egan suggests that the simple story form is useful for arranging curriculum for students in the mythic stage. He relies on Aristotle's description of the story form which "has a beginning that sets up expectations, a middle that complicates them, and an end that satisfies them" (p. 17). He notes that the value of the story form for young children is that it fixes meaning.

We know we have reached the end of a story when we know how to feel about all the events that compose it...The end involves satisfying the expectations set up in the beginning, thus creating a whole, a unit, within which meaning and feeling are bound together and ultimately fixed (p. 17).

The story form can traverse an infinite range of ideas, and as such it could be useful as a tool for investigating how children emotionally and cognitively organize and construct meaning from ideas presented in this fashion.

Another tool for examining the relation between cognition and emotion is art. Oatley (1992) notes that the "artist has not just to depict emotions but to allow readers to be moved by their own emotions as they read and also to reflect on them" (p. 256). Oatley analyzes George Eliot's use of emotion in *Middlemarch*. He states:

Hers is a means of inviting self-reflection on our model of self, without forcing our interpretations of the events that occur in the story or rigidly programming our emotions as they occur in response to them. This allowing of the reader's own creativity is what distinguishes, I think, great art such as hers from formula written novels whose purpose is largely to program particular emotions in the reader. George Eliot's art allows a kind of experimentation within the self that may promote understanding of our own emotions and their relation to other people (p.261).

The idea that art can inform our own emotions, extends and broadens the idea of cognitive/ emotional engagement. Oatley is suggesting that we not only structure a novel, poem, painting, or sculpture through our emotional/cognitive engagement, but that structure may be informed by and change in relation to our engagement with a piece of art. From a constructivist perspective, art provides the opportunity to study not only how we construct knowledge of the world, but how our constructions are altered by the objects of knowing.

The potential knowledge that could be gained from studying art in this way suggests that the arts and literature may have too long been neglected as a source of data for psychology in general and for specifically understanding the relationship between cognition and emotion. Freud stands out as the most prominent example of a theorist relying on the arts to inform and shape his theory. Most recently, Keith Oatley (1992) uses narrative in the form of poetry, novels and theatre to explore how various authors conceive of and use emotions in their narratives. He also uses narrative to engage the emotions

of his readers in order to provide opportunities for readers to explore their own emotions.

Apart from Oatley's work, an interesting example of this use of narrative is Jeanette Haviland's (1984) study of Virginia Woolf's writings. Treating the diaries as a case, Haviland explored the relationship between thinking and feeling as Woolf articulated and analyzed these aspects of herself from early childhood through adulthood. In justifying this kind of study, Haviland refers to a question posed by Allport who asked whether psychologists could add to the analyses already provided by literary genius. Haviland responds and says "if we inquire into the process that allows [Woolf] to see her own particular centrality, we will be asking a question about becoming or developing that kind of clarity. Woolf, at least, was drawn by the sheer existence of a trait or ability of thought; we are drawn to know how the trait came to be identified" (p.519).

Conclusion

If we are to understand the intricate weave of emotion and cognition we must be willing to broaden the ways in which we have traditionally studied these phenomena. We are surrounded by evidence of the interaction between emotion and cognition whenever we seek understanding and knowledge, but it does not appear that we can come close to describing

the link between feeling and thought with molecular and highly controlled experimental studies. We have succeeded at making coarse approximations, and current findings hint at how these two components of the self converge, but if we want to describe and understand what happens when we are lost in thought or lost in a poem, a novel, a painting we will need to broaden our methods to include wholistic study. Literary analysis, ethnography, case study, observation, and interview may provide the breadth and depth that we need to come closer to understanding how we as individuals make sense of the world. These methods can also allow for a different sort of engagement with the world we are studying. If we structure our world with intellectual tools that are both affective and cognitive then it makes sense to construct our knowledge of the interaction between affect and cognition by using these very same tools.

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